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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/729,863

12/05/2003

Geoffrey T. Dunbar

MSI-1720US

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7590

07/19/2007

LEE & HAYES PLLC

421 W RIVERSIDE AVENUE SUITE 500

SPOKANE, WA 99201

EXAMINER

DANG, HUNG Q

ART UNIT

PAPER NUMBER

2621

MAIL DATE

DELIVERY MODE

07/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/729,863

Applicant(s)

DUNBAR ET AL.

Examiner

Hung Q. Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 03/22/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

Claim 31 is objected to because of the following informalities: Claim 31 recites "the video decoder deletes alternating frames of received audio data". It should be "the video decoder deletes alternating frames of received video data". Appropriate correction is required. To expedite prosecution, the Examiner will read it as "... of received video data".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 7-10, 15-24, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Comer (US Patent 6,201,927).

Regarding claim 1, Comer discloses a method comprising: receiving a request to play compressed video data in a reverse direction (column 2, lines 54-56); identifying a most recent key frame received (column 2, lines 57-60; Fig. 1B; Fig. 2); decoding the most recent key frame (column 2, lines 57-63; Fig. 2); identifying delta frames received after the most recent key frame (Fig. 2; column 3, lines 22-31); decoding the identified delta frames (Fig. 2; column 3, lines 22-31); and playing the decoded delta frames in the reverse direction (Fig. 1B; Fig. 2; column 3, lines 32-51).

Regarding claim 2, Comer also discloses playing the decoded key frame playing the decoded delta frames in the reverse direction (Fig. 1B; Fig. 2; column 3, lines 43-45).

Regarding claim 3, Comer also discloses playing the decoded key frame after playing the decoded delta frames in the reverse direction (Fig. 1B; Fig. 2; column 3, lines 43-45); identifying a next most recent key frame (column 3, lines 38-40; Fig. 1B; Fig. 2); decoding the next most recent key frame (Fig. 2); identifying a second set of delta frames received after the next most recent key frame and before the most recent key frame (Fig. 1B; Fig. 2; column 3, lines 41-48); decoding the second set of delta frames (Fig. 1B; Fig. 2; column 3, lines 41-48); and playing the second set of decoded delta frames in the reverse direction (Fig. 1B; Fig. 2; column 3, lines 41-51).

Regarding claim 4, Comer also discloses decoding the identified delta frames includes decoding the identified delta frames in a forward playback direction (Fig. 1B; Fig. 2; column 3, lines 23-31).

Regarding claim 5, Comer also discloses decoding the identified delta frames includes utilizing data contained in the most recent key frame (column 2, lines 30-42; column 11, lines 42-56; column 12, lines 47-50).

Regarding claim 7, Comer also discloses decoding the identified delta frames includes storing 1 of N identified delta frames and discarding the remaining identified delta frames (Fig. 8A; column 12, lines 32-57).

Regarding claim 8, Comer also discloses N is an integer portion of a result of applying a square root function to the number of delta frames associated with each key

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frame (Fig. 8A – Note that, in Fig. 8A, N is 3, which is equal to the integer portion of square root of total number of delta frames associated with each key frame, which is 11).

Regarding claim 9, Comer also discloses deleting alternating delta frames after decoding the identified delta frames (In Fig. 8A, for GOP B, P(19) is not deleted while P(16) and P(22) are deleted and not displayed as shown in the display sequence).

Regarding claim 10, Comer also disclose deleting N of every P frames after decoding the identified delta frames, wherein N and P are integers (In Fig. 8A, 10 frames are deleted out of 12 frames from display as shown in the display sequence).

Regarding claim 15, Comer also discloses decoding the most recent key frame includes partially decoding the most recent key frame to an intermediate format (column 11, lines 11-61; Fig. 7).

Regarding claim 16, Comer also discloses the intermediate format is used in decoding the identified delta frames (column 11, lines 42-56).

Regarding claim 17, Comer also discloses decoding the identified delta frames includes partially decoding at least one of the identified delta frames to an intermediate format (column 11, lines 51-61; column 11, line 62 – column 12, line 12).

Regarding claim 18, Comer also discloses the intermediate format is used in decoding subsequent delta frames (column 11, line 62 – column 12, line 12).

Claim 19 is rejected for the same reason as discussed in claim 1.

Regarding claim 20, Comer discloses a method comprising: receiving a request to play compressed video data in a reverse direction (column 2, lines 54-56); identifying

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a most recent key frame previously received (column 2, lines 57-60; Fig. 1B; Fig. 2); decoding the most recent key frame (column 2, lines 57-63; Fig. 2); identifying delta frames received subsequent to the most recent key frame (Fig. 2; column 3, lines 22-31); decoding the identified delta frames (Fig. 2; column 3, lines 22-31); deleting N of P delta frames, wherein N and P are integers (In Fig. 8A, 10 frames are deleted out of 12 frames from display as shown in the display sequence); and playing the remaining identified delta frames in the reverse direction (Fig. 8A).

Regarding claim 21, Comer also discloses storing the identified delta frames that were not deleted (Fig. 2; column 3, lines 6-8, 23-31).

Regarding claim 22, Comer also discloses playing the decoded key frame after playing the remaining identified delta frames in the reverse direction (column 3, lines 32-45).

Regarding claim 23, Comer also discloses decoding the identified delta frames includes utilizing information contained in the most recent key frame (column 2, lines 30-42; column 11, lines 42-56; column 12, lines 47-50).

Regarding claim 24, Comer also discloses decoding the identified delta frames includes utilizing information contained in the most recent key frame and information contained in any intervening delta frames (column 2, lines 30-42; column 11, lines 42-56, 62-63; column 12; lines 47-50).

Claim 27 is rejected for the same reason as discussed in claim 20 above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927).

Regarding claim 6, see the teachings of Comer as discussed in claim 1 above. Comer further discloses decoding compressed video bit stream (column 4, lines 55-58) and the key frame is compressed according to MPEG standard (column 10, lines 45-51, 56-63). However, Comer does not disclose decoding the most recent key frame includes decompressing the most recent key frame.

It is well known in the art that decoding compressed MPEG frame must comprise decompressing. Therefore, Official Notice is taken.

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate the decompressing the key frame into the method disclosed by Comer to make it compatible with existing standards such as MPEG because those standards like MPEG uses compression during encoding.

Claims 11 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927) as applied to claims 1-5, 7-10, 15-24, and 27 above, and further in view of Wang et al. (US Patent 5,193,004) and Thompson (US Patent 4,661,862).

Regarding claim 11, see the teachings of Comer as discussed in claim 1 above. Comer also discloses deleting fields of each decoded delta frames (column 11, lines 53-61). However, Comer does not disclose deleting alternating rows of pixels in each decoded delta frame and deleting alternating pixels in non-deleted rows of pixels in each decoded delta frame.

Wang et al. disclose deleting either odd or even fields, each of which includes alternating rows of pixels, in each frame (column 1, lines 10-15).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate the step of deleting alternating rows of pixels as disclosed by Wang et al. into the method disclosed by Comer to reduce the bandwidth of the signals. The incorporated feature would speed up processing and fast playback.

However, the proposed combination of Comer and Wang et al. does not disclose deleting alternating pixels in non-deleted rows of pixels in each decoded delta frame.

Thompson discloses deleting alternating pixels in non-deleted rows of pixels in each decoded delta frame (abstract).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate the step of deleting alternating pixels in non-deleted rows of pixels as disclosed by Thompson into the method disclosed by Comer and Wang et al. to further reduce the bandwidth of the signals. The incorporated feature would further speed up the processing and fast playback. Also it would make the method compatible with display device with less resolution.

Claim 25 is rejected for the same reason as discussed in claim 11 above.

Claim 26 is rejected for the same reason as discussed in claim 11 above.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927) as applied to claims 1-5, 7-10, 15-24, and 27 above, and further in view of Miyano (US Patent 5,694,172).

Regarding claim 12, see the teaching of Comer as discussed in claim 1 above. However, Comer does not disclose reducing an amount of data associated with each pixel in each decoded delta frame; and storing the reduced amount of data associated with each decoded delta frame.

Miyano discloses reducing an amount of data associated with each pixel in each decoded delta frame (column 4, lines 28-33); and storing the reduced amount of data associated with each decoded delta frame (column 4, lines 48-51).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate the steps of reducing an amount of data associated with each pixel in each decoded delta frame; and storing the reduced amount of data associated with each decoded delta frame as disclosed by Miyano into the method disclosed by Comer to reduce the bandwidth of the signals. The incorporated feature would speed up the processing and fast playback. Also it would make the method compatible with display device with less resolution.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927) as applied to claims 1-5, 7-10, 15-24, and 27 above, and further in view of Rault (US 2004/0179597) and Oura et al. (US 2003/0007556).

Regarding claim 13, see the teachings of Comer as discussed in claim 1 above. However, Comer does not disclose applying a lossless compression algorithm to each decoded delta frame; and storing each of the compressed delta frames.

Rault discloses applying a lossless compression algorithm ([0027]; [0028]) to each decoded delta frame ([0058]; [0064]; [0066]).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate applying a lossless compression algorithm to each decoded delta frame as disclosed by Rault into the method disclosed by Comer to transcode the video data into different popular encoding schemes without degrading the quality of the data. The incorporated feature that provides transcoding function would make the method more robust because of its capability of producing output signals of different formats.

However, the proposed combination of Comer and Rault does not disclose storing each of the compressed delta frames.

Oura et al. disclose storing each of the compressed delta frames ([0069]).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate the step of storing the encoded frames as disclosed by Oura et al. into the method disclosed by Comer and Rault for storage purpose so that later playback is possible; thus, making the method more useful.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927) as applied to claims 1-5, 7-10, 15-24, and 27 above, and further in view of Wilkinson (US Patent 4,689,697).

Regarding claim 14, see the teachings of Comer as discussed in claim 1 above. Comer also discloses identifying at least one compressed audio packet associated with the compressed video data (column 4, lines 55-58; column 5, lines 28-36); decoding the compressed audio packet (column 5, lines 40-42); and playing the decoded audio packet (column 5, lines 42-45). However, Comer does not disclose playing the audio packet in reverse order. Comer only discloses playing the decoded video in reverse order (Fig. 1B; Fig. 8A; column 3, lines 32-54).

Wilkinson discloses playing audio packet in reverse order (column 7, lines 19-28).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate playing the audio packets in reverse order disclosed by Wilkinson into the method disclosed by Comer so that the audio is synchronized and consistent with scenes presented by the video data when they are played back in the reverse order because playing audio in forward direction while playing the video in reverse direction would make the audio irrelevant and annoying.

Claims 28-29, 31-36, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927) and Wilkinson (US Patent 4,689,697).

Regarding claim 28, Comer discloses an apparatus comprising: an audio decoder coupled to receive compressed audio data and decode the compressed audio data (column 5, lines 40-42; "AC3/MPEG AUDIO DECODER" in Fig. 4); an audio data store coupled to the audio decoder (column 5, lines 40-42); a video decoder coupled to

receive compressed video data and decode the compressed video data ("MPEG DECODE" in Fig. 3; "MPEG2 VIDEO DECODER" in Fig. 4; column 5, lines 17-19, 28-36); a video data store coupled to the video decoder ("FRAME BUFFER" in Fig. 3; "FRAME BUFFERS" in Fig. 4); and a reverse playback controller coupled to the audio decoder and the video decoder, wherein the reverse playback controller generates the decoded video data in a reverse direction (Fig. 1B; Fig. 2; column 3, lines 32-54).

Comer does not disclose the reverse playback controller to generate the decoded audio data in a reverse direction.

Wilkinson discloses a reverse playback controller to generate audio data in a reverse direction (column 7, lines 19-28).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate playing the audio packets in reverse order disclosed by Wilkinson into the apparatus disclosed by Comer so that the audio is synchronized and consistent with scenes presented by the video data when they are played back in the reverse order because playing audio in forward direction while playing the video in reverse direction would make the audio irrelevant and annoying.

Regarding claim 29, Comer also discloses the compressed video data includes at least one key frame and a plurality of delta frames associated with the key frame (Fig. 1B; Fig. 8A; column 2, lines 26-52).

Regarding claim 31, Comer also discloses the video decoder deletes alternating frames of received video data (In Fig. 8A, for GOP B, P(19) is not deleted while P(16) and P(22) are deleted and not displayed as shown in the display sequence).

Regarding claim 32, Comer also discloses the reverse playback controller is further coupled to receive forward playback instructions and reverse playback instructions (column 2, lines 53-57).

Regarding claim 33, Comer discloses one or more computer-readable media having stored thereon a computer program that, when executed by one or more processors, causes the one or more processors to: receive a request to play compressed multimedia data in a reverse direction (column 2, lines 54-56); identify a most recent video key frame received in the compressed multimedia data (column 2, lines 57-60; Fig. 1B; Fig. 2); decode the most recent video key frame (column 2, lines 57-63; Fig. 2); identify video delta frames received after the most recent video key frame (Fig. 2; column 3, lines 22-31); decode the identified video delta frames (Fig. 2; column 3, lines 22-31); identify at least one compressed audio packet in the compressed multimedia data (column 5, lines 40-42); decode the compressed audio packet (column 5, lines 40-45); and play the decoded video delta frames and the decoded audio packet in the reverse direction (Fig. 1B; Fig. 2; column 3, lines 32-54).

Comer does not disclose playing the decoded audio data in a reverse direction.

Wilkinson discloses playing audio data in a reverse direction (column 7, lines 19-28).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate playing the audio packets in reverse order disclosed by Wilkinson into the apparatus disclosed by Comer so that the audio is synchronized and consistent with scenes presented by the video data when they are played back in the

reverse order because playing audio in forward direction while playing the video in reverse direction would make the audio irrelevant and annoying.

Regarding claim 34, Comer also discloses one or more computer-readable media as recited in claim 33 wherein the audio packet is associated with at least one decoded delta frame (column 5, lines 40-45).

Regarding claim 35, Comer also discloses alternating video delta frames are deleted after decoding the alternating video delta frames (In Fig. 8A, for GOP B, P(19) is not deleted while P(16) and P(22) are deleted and not displayed as shown in the display sequence).

Regarding claim 36, Comer also discloses N of P video delta frames are deleted after decoding the video delta frames N wherein N and P are integers (In Fig. 8A, 10 frames are deleted out of 12 frames from display as shown in the display sequence).

Regarding claim 38, Comer also discloses the one or more processors further store the decoded video delta frames and the decoded audio packet (column 3, lines 17-31; column 5, lines 40-45).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927) and Wilkinson (US Patent 4,689,697) as applied to claims 28-29, 31-36, and 38 above, and further in view of Peng (US Patent 6,269,117).

Regarding claim 30, see the teachings of Comer and Wilkinson as discussed in claim 28 above. Further, Comer also discloses the reverse playback controller discards alternating frames of received video data (In Fig. 8A, for GOP B, P(19) is not deleted

while P(16) and P(22) are deleted and not displayed as shown in the display sequence). However, the proposed combination of Comer and Wilkinson does not disclose the reverse playback controller does the operation of discarding alternating frames of received audio data.

Peng discloses the operation of discarding alternating frames of received audio data (column 9, lines 51-53; column 5, lines 8-12).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate the operation of discarding alternating frames of received audio data as disclosed by Peng into the reverse playback controller to lower the sample rate of the audio during a fast reverse playback. The incorporated feature is necessary to keep the audio in sync with the video during a fast reverse playback. It also helps speed up the processing and outputting because of low bandwidth.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US Patent 6,201,927) and Wilkinson (US Patent 4,689,697) as applied to claims 28-29, 31-36, and 38 above, and further in view of Rault (US 2004/0179597) and Oura et al. (US 2003/0007556).

Regarding claim 37, see the teachings of Comer and Wilkinson as discussed in claim 33 above. However, the proposed combination of Comer and Wilkinson does not disclose applying a lossless compression algorithm to each decoded delta frame; and storing each of the compressed delta frames.

Rault discloses applying a lossless compression algorithm ([0027]; [0028]) to each decoded delta frame ([0058]; [0064]; [0066]).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate applying a lossless compression algorithm to each decoded delta frame as disclosed by Rault into the computer-readable media disclosed by Comer and Wilkinson to transcode the video data into different popular encoding schemes without degrading the quality of the data. The incorporated feature that provides transcoding function would make the computer-readable media more robust because of its capability of producing output signals of different formats.

However, the proposed combination of Comer and Rault does not disclose storing each of the compressed delta frames.

Oura et al. disclose storing each of the compressed delta frames ([0069]).

One of ordinary skill in the art at the time the invention was made would have been motivated to incorporate the step of storing the encoded frames as disclosed by Oura et al. into the computer-readable media disclosed by Comer, Wilkinson, and Rault for storage purpose so that later playback is possible; thus, making the method more useful.

Conclusion

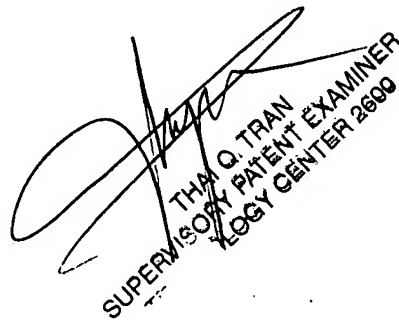
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Q. Dang whose telephone number is 571-270-1116. The examiner can normally be reached on M-Th:7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thai Tran can be reached on 571-272-7382. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hung Dang


THIA Q. TRAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600